

Original Article

# Prevalence of Depressive Symptoms among Medical Students of Faculty of Medicine, Derna

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## ABSTRACT

**Background and aims.** Anxiety, fear, and depression significantly impact the academic performance and overall well-being of medical students, especially those facing multiple stressors. In Derna, Libya, students have confronted civil unrest challenges compounded by the COVID-19 pandemic. Recognizing the prevalence of depressive symptoms among these students is paramount. This study represents the inaugural investigation in Derna, aiming to evaluate depression prevalence among Faculty of Medicine students. **Methods.** A cross-sectional study conducted at Derna University from August 17 to 30, 2022, involved medical students across all academic years. The Patient Health Questionnaire-9 (PHQ-9) assessed depressive symptoms, categorizing scores  $\geq 15$  as indicative of moderately severe to severe depression. Statistical analyses, including chi-square and Spearman correlation tests, analyzed the collected data. **Results.** About 262 students participated, revealing that 28.6% had a PHQ score  $\geq 15$ , denoting moderate to severe depression, with 24.1% reporting suicidal thoughts. Depression exhibited significant associations with students' family mean monthly income ( $P=0.02$ ) and their preferences concerning attending lectures or studying solely from home ( $P=0.012$ ). **Conclusion.** The findings underscore a critical need for tailored mental health services and support programs targeting the well-being of medical students. Implementing dedicated measures, involving academic mentors and medical tutors, is imperative to effectively support these students. This study emphasizes the urgency of prioritizing mental health resources and strategies to alleviate the burden of depression among medical students in Derna, Libya, ensuring their academic success and overall well-being.

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## INTRODUCTION

Depression is a psychological condition marked by a lack of interest and enjoyment, less energy, guilt or feelings of low self-worth, interrupted sleep and/or appetite, and trouble concentrating [1], stands as the second most prevalent mental disorder globally, following anxiety, affecting approximately 3.4% of the world's population or about 264 million

individuals [2]. College students, comprising a unique demographic undergoing significant transitional phases during their academic journey, encounter higher rates of depression compared to the general population [3]. This susceptibility is attributed to the confluence of hormonal shifts and changes in environmental factors experienced during this pivotal period [4].

Notably, within the realm of university education, medical students consistently report heightened levels of stress and depression [5-7]. Recent meta-analytical studies have revealed that nearly one-third of medical students worldwide grapple with depression [3]. Additionally, the prevalence of academic-related depression in this group stands at 20%, markedly higher than the 8.6% burnout rate observed in the general population [8].

The correlation between depression and heightened suicide rates is striking, especially evident among medical professionals, surpassing the rates in the general population [9], particularly among female practitioners [10]. Alarmingly, 12% of medical students grapple with suicidal ideation during their educational journey [11].

In Libya, the prolonged periods of civil unrest and the disruptive impact of the COVID-19 pandemic have significantly extended the duration of medical education. The resultant closures of medical schools for extended periods have delayed the graduation and educational progression of numerous medical students. This prolonged academic uncertainty and upheaval have posed potential risks to the psychological well-being of these students.

Considering that today's medical students are the future healthcare providers, prioritizing their mental health is imperative. However, despite the critical importance of this issue, there is a dearth of recent studies addressing the psychological well-being of students in our university. Thus, the primary objective of this study is to evaluate the prevalence of depression and identify its associated risk factors among undergraduate medical students at Derna University. By shedding light on these crucial aspects, current study aims to pave the way for targeted interventions and support mechanisms to safeguard the mental health of our future healthcare professionals.

## METHODS

### *Study design and setting*

A cross-sectional study was undertaken among the entirety of medical students enrolled at Derna University during the period spanning August 17th to 30th, 2022. Employing a simple random sampling technique, students who voluntarily consented to participate and completed the questionnaire were included to ensure accuracy and prevent selection bias. The sample size, determined by the formula [12].

$$n = \frac{z^2 * p * (1-p)}{e^2} \div \left[ 1 + \left( \frac{z^2 * p * (1-p)}{e^2 * N} \right) \right]$$

Where:

z = 2.33 for a confidence level ( $\alpha$ ) of 98%

p = proportion. p = 0.216

N = population size. N = 900

e = margin of error. e = 0.05

n  $\approx$  262                      Resulted in an approximate sample size of 262 participants.

### *Data collection procedure*

The questionnaire, disseminated through Google Forms via social media groups, provided students with information about the study and ensured their voluntary participation, emphasizing anonymity in data usage. Only fully completed questionnaires were considered for analysis. Students under medication or diagnosed with depression were excluded.

### *The questionnaire was bifurcated into two sections*

1. Socio-demographic Information: Covering gender, age, current study year, marital status, parental status, living arrangements, income sources, housing status, family income, hobbies, academic history, and preference for learning environment (lecture attendance vs. home study).
2. PHQ-9 Questionnaire: Comprising 9 parts to gauge the prevalence and severity of depression [13], wherein a score  $\geq$  15 indicated depressions.

**Statistical analyses**

Statistical Analyses included Spearman's rank-order correlation test to assess the relationship between PHQ-9 scores and study year, Chi-square test for independence between PHQ-9 levels and categorical variables, and Mann-Whitney U and Kruskal-Wallis tests to evaluate significant differences in PHQ scores across various variables.

Data were entered into Microsoft Excel and analyzed using the Statistical Package for Social Sciences (SPSS version 20). Ethical clearance was obtained from the university ethics committee on August 10<sup>th</sup>, 2022. This methodology ensured rigorous data collection and analysis while maintaining ethical considerations and confidentiality in line with research protocols.

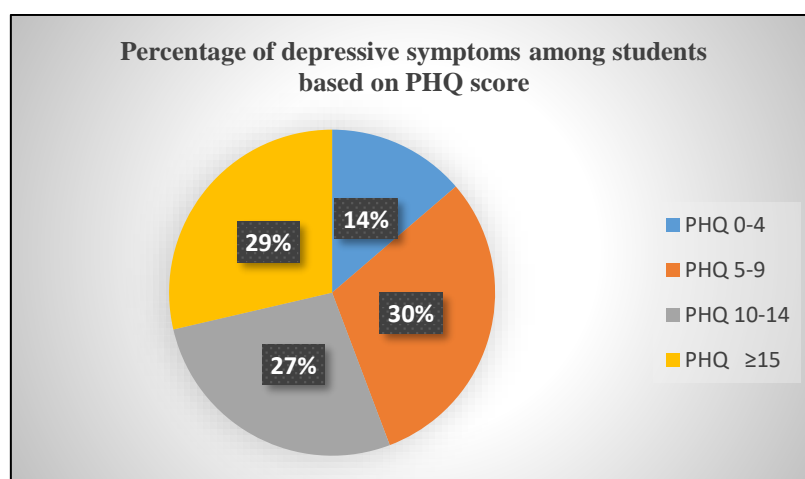
**RESULTS**

Out of 272 students who completed the questionnaire, 10 individuals (3.7%) were excluded due to non-conformance with the inclusion criteria, resulting in 262 participants (96.3%). Among the included participants, a predominant majority were females, constituting 211 individuals (80.5%), while 51 individuals (19.5%) were males. In terms of academic progression, a larger portion of the participants, specifically 161 students (61.5%), were in their preclinical stage, whereas 101 students (38.51%) were categorized in the clinical stage. Refer to Table 1 for a detailed distribution of students across the academic years.

*Table 1. The distribution of participants year wise*

Year of study	N (%)
1 <sup>st</sup>	49(18.7%)
2 <sup>nd</sup>	67(25.6%)
3 <sup>rd</sup>	47(17.9%)
4 <sup>th</sup>	33(12.6%)
5 <sup>th</sup>	49(18.7%)
Internship	17(6.5%)

The severity of students' depression symptoms was categorized into five distinct levels using the PHQ-9 scale, a visual representation is illustrated in Figure 1. Scores on the PHQ-9 scale ranged from 1 to 27, with a median score of 10 (Interquartile Range, IQR: 6-15). The mean score for the PHQ-9 scale was 11.2, with a standard deviation of 6.



*Figure 1. Percentage of depressive symptoms among students based on PHQ score*

Among study cohort, 63 students (24.1%) reported experiencing suicidal thoughts, delineated as follows: 43 individuals (16.4%) reported these thoughts for several days, 8 individuals (3.1%) for more than half of the days, and 12 individuals (4.6%) had these thoughts almost daily. Analysis revealed a higher prevalence of depressive symptoms among females, with 65 cases (30.8%) compared to males, totaling 10 cases (19.6%). Moreover, depressive symptoms manifested more

prominently among preclinical students, encompassing 52 individuals (32.3%) in contrast to clinical students, comprising 23 individuals (22.8%).

Statistical analysis, as depicted in Figure 2, indicated a significant association between the mean monthly income of students' families and the severity of depression ( $\chi^2(8) = 18.122, P = 0.02$ ). This association suggests that students from families with lower incomes face a heightened risk of experiencing depression. Additionally, a statistically significant correlation emerged between students' preferences regarding attending lectures or studying solely from home ( $\chi^2(4) = 12.794, P = 0.012$ ). This finding suggests that students favoring home study and abstaining from lectures exhibit a higher incidence of depressive symptoms.

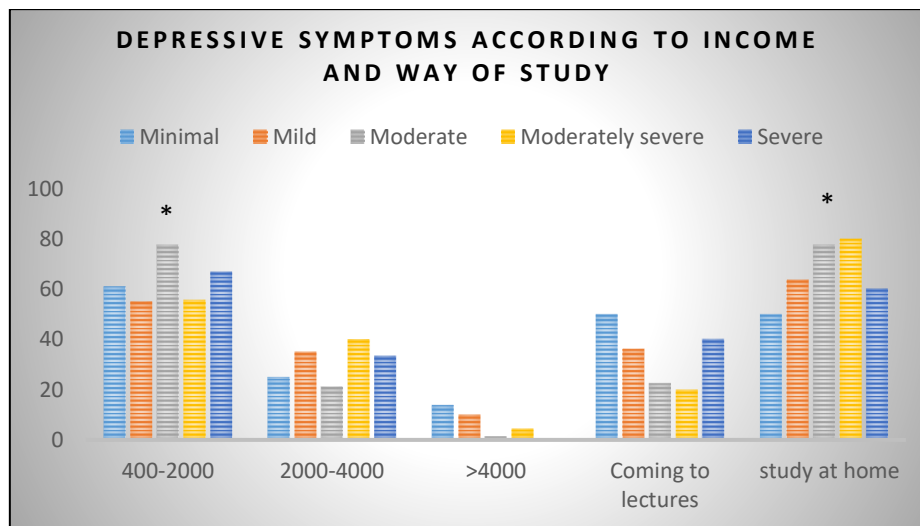


Figure 2. depressive symptoms according to income and way of study; score, \* indicates p value less than 0.05.

A Spearman's correlation analysis was executed to explore the potential relationship between the PHQ-9 depression score and the students' academic year, unearthing a noteworthy negative correlation ( $r_s = -0.123, P = 0.046$ ). Additionally, notable differences in depression severity surfaced concerning gender ( $P = 0.03$ ), mean income ( $P = 0.009$ ), and engagement in hobbies ( $P = 0.015$ ).

However, no significant correlation emerged between depressive symptoms and various variables, including age range, social status, living arrangements (with parents or alone), housing tenure (owned or rented), sources of income, academic history (previous year failures), or parental status (deceased or alive) ( $P > 0.05$ ). Interestingly, a discernible trend in depressive symptomatology revealed an ascent as students progressed to the second year, predominantly within the preclinical phase, succeeded by a descent upon transitioning to the clinical phase.

This pattern reached its nadir during the internship phase, suggesting a potential alleviation of academic burdens at this advanced stage of training.

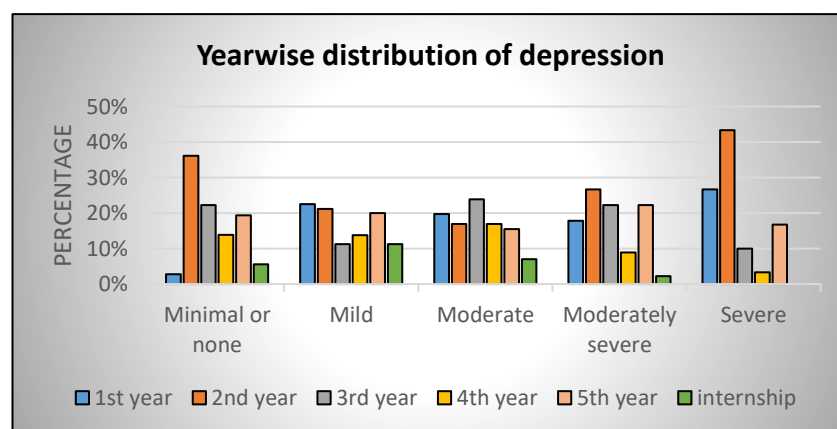


Figure 3. Yearwise distribution of depression

## DISCUSSION

Anxiety, fear, and depression profoundly impact students' outcomes, leading to potential repercussions such as medical school dropout, reduced work efficiency, strained relationships, and heightened suicidal tendencies. The immense stress faced by medical students globally is multifaceted, encompassing the influence of senior perspectives, the extensive demands of lectures and study materials, and the weighty responsibility of safeguarding human lives. Notably, in the context of Libya and Derna, students grappled with the distressing experiences of civil unrest and COVID-19 lockdowns, further exacerbating their psychological burden. Our investigation highlighted a disconcerting prevalence of depression among University of Derna medical students, with a staggering 86.3% reporting varying degrees of depressive symptoms, including 28.6% grappling with moderately severe to severe depression. These rates align closely with a meta-analysis by Puthran et al. [8], which reported a 28.0% depression prevalence among students. A study of Palestinian medical students by Shawahna et al. [14] documented slightly lower depressive symptom rates at 23.1%, contrasting with our findings.

Gold et al. [15] highlighted that medical student in Middle Eastern countries, particularly in Libya's case, registered the highest depression rates (41.1%), defined by a PHQ-2 score of  $\geq 3$ , surpassing rates in China (14.1%) and the US (3.8%). Moreover, our research underscored that Derna medical students faced a higher depression risk compared to their Libyan counterparts in other medical schools. Elhadi et al.'s study [16] across 15 Libyan medical institutions, excluding Derna, noted a lower prevalence of moderate to severe depression at 21.6%, although the rates of suicidal ideation were comparable at 22.7%. We hypothesize that the heightened depression levels among Derna students might be attributed to the whole-year study system in contrast to some Libyan schools adopting the less strenuous semester system, as echoed by 62.2% of our students citing the 'huge curriculum' as a primary stressor during medical studies.

Contrary to findings by Alharbi et al. [17] in Saudi Arabia, the current study highlighted gender-based differences in depression prevalence, aligning with research trends indicating a higher susceptibility among female students. Moreover, our results revealed a predominant prevalence of depressive symptoms during preclinical stages (32.3%) compared to clinical stages (22.8%). Notably, the dip in depression levels among fourth-year students potentially reflects an acclimatization to study routines, while the subsequent rise among fifth-year students signifies heightened apprehension, later declining during the internship year. This observation correlates with the intensive workload during the foundational years of biomedical study.

However, the findings diverge from Elhadi et al.'s [16] conclusions regarding increased depression rates in advanced academic years, with our study indicating heightened depression levels among first-year students, resonating with several other investigations. Akin to Suraj et al.'s study [18] in Nigeria, we noted higher depressive symptoms among preclinical students (32.3%) compared to clinical students (22.8%).

Alarmingly, it is revealed a significantly high prevalence of suicidal ideation (24.18%) among students compared to similar studies. For instance, Olum et al.'s research [23] reported 21.5% suicidal ideation among students at Makerere University, Uganda. Interestingly, depression was markedly prevalent among students favoring home study over attending lectures ( $P=0.012$ ). Encouraging lecture attendance and fostering engaging activities may alleviate depression among these students. Furthermore, uncertainties surrounding post-graduation choices, linked to rumors about WFME's withdrawal of accreditation from Libyan medical schools in 2024, were cited as a significant stressor by 21.4% of the students.

This study possesses certain limitations, notably its cross-sectional design, limiting causal inference and comparisons across different academic years. The gender imbalance in the study sample could have impacted result distribution. Variables such as sleep duration, physical activity, and personality traits, potentially associated with depression prevalence, were not evaluated. Additionally, the preponderance of preclinical participants might affect the results' generalizability. The study period coinciding with final examinations might have amplified depressive feelings among some students. Moreover, students with mental health concerns might have declined participation, introducing potential selection bias. However, the study stands out as the inaugural exploration of its kind within our medical school, offering valuable insights into our students' mental health status.

## CONCLUSION

The study illuminated the prevalence of depressive symptoms among medical students in Derna, uncovering specific risk factors associated with their onset, including low family income, a lack of engagement in hobbies, studying exclusively at home, and avoiding lectures. To bolster healthcare outcomes and mitigate the risk of suicide, governmental intervention prioritizing students' mental health is imperative. Financial assistance aimed at economically disadvantaged students is essential. Creating an affirmative and supportive environment through school outings, diverse sports tournaments, fostering encouragement for hobbies, equipping students with the necessary resources to develop these interests, and promoting an open culture for students to voice their concerns and emotions—all these initiatives

may significantly alleviate the levels of depression among our student cohort.

### **Future directions**

Performing similar study in other collages such as biotechnology and pharmacology and comparing the results with ours. Including the postgraduates in the study to ensure if that the huge curriculum is the major cause of depression. Adding anxiety, stress and sleep quality tests in future studies. Performing a cohort study on medical students from their first days in the collage and comparing them with future results of the same students. Currently, after the disaster that affected the city, this study will be reconducted to assess the effect of the recent situation on the students.

### **Conflict of Interest**

There are no financial, personal, or professional conflicts of interest to declare.

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## انتشار أعراض الاكتئاب بين طلاب الطب بكلية الطب بدرنة

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### المستخلص

**الخلفية والأهداف.** يؤثر القلق والخوف والاكتئاب بشكل كبير على الأداء الأكاديمي والرفاهية العامة لطلاب الطب، وخاصة أولئك الذين يواجهون ضغوطات متعددة. في درنة، ليبيا، واجه الطلاب تحديات الاضطرابات المدنية التي تفاقمت بسبب جائحة كوفيد-19. يعد التعرف على مدى انتشار أعراض الاكتئاب بين هؤلاء الطلاب أمرًا بالغ الأهمية. تمثل هذه الدراسة الدراسة الافتتاحية في درنة، والتي تهدف إلى تقييم مدى انتشار الاكتئاب بين طلاب كلية الطب. **طرق الدراسة.** أجريت دراسة مقطعية في جامعة درنة في الفترة من 17 إلى 30 أغسطس 2022، وشملت طلاب الطب في جميع السنوات الأكاديمية. قام استبيان صحة المريض -9 (PHQ-9) بتقييم أعراض الاكتئاب، وصنف الدرجات  $\leq 15$  كمؤشر على الاكتئاب المعتدل إلى الشديد. قامت التحليلات الإحصائية، بما في ذلك اختبارات ارتباط كاي مربع وسبيرمان، بتحليل البيانات المجمعة. **النتائج.** شارك حوالي 262 طالبًا، وكشفوا أن 28.6% منهم حصلوا على درجة  $\geq 15$  PHQ، مما يدل على اكتئاب معتدل إلى شديد، مع إبلاغ 24.1% عن أفكار انتحارية. أظهر الاكتئاب ارتباطات كبيرة بمتوسط دخل أسرة الطلاب الشهري ( $P = 0.02$ ) وتفضيلاتهم فيما يتعلق بحضور المحاضرات أو الدراسة من المنزل فقط ( $P = 0.012$ ). **الخاتمة.** تؤكد النتائج على الحاجة الماسة لخدمات الصحة العقلية وبرامج الدعم المخصصة التي تستهدف رفاهية طلاب الطب. ومن الضروري تنفيذ تدابير مخصصة، تشمل موجهين أكاديميين ومعلمين طبيين، لدعم هؤلاء الطلاب بشكل فعال. تؤكد هذه الدراسة على الحاجة الملحة إلى إعطاء الأولوية لموارد واستراتيجيات الصحة العقلية للتخفيف من عبء الاكتئاب بين طلاب الطب في درنة، ليبيا، وضمان نجاحهم الأكاديمي ورفاههم بشكل عام.

**الكلمات الدالة.** طلاب الطب، أعراض الاكتئاب، الانتحار، درنة.